CLAIMS

1. A method of manufacture comprising the following steps:

intermittently advancing a first elongated continuous structure made of flexible material along a process pathway during each work cycle, each advance of said first elongated continuous structure being equal in distance to one unit length, said first elongated continuous structure not advancing during a dwell time of each work cycle;

during each dwell time, forming a respective structural feature of a first type on said first elongated continuous structure, said structural features of said first type being spaced at regular intervals, one structural feature of said first type per unit length;

during each dwell time, tacking a respective zone on a second elongated continuous structure made of flexible material to a respective zone on said first elongated continuous structure, said tack zones being spaced at regular intervals along a line that does not intersect said structural features of said first type, one tack zone per unit length, and being generally aligned with respective zones separating said structural features of said first type;

during each dwell time, joining said first and second elongated continuous structures along a respective line segment connecting successive tack zones,

wherein an untacked and unjoined trailing section of said second elongated continuous structure is pulled forward when said first elongated continuous structure is advanced.

2. The method as recited in claim 1, wherein said first elongated continuous structure comprises a web of packaging film, said second elongated continuous structure comprises first and second zipper strips that are interlocked with each other, each of said structural features of said first type is a respective pocket formed in said packaging film, and one unit length equals one

package length.

3. The method as recited in claim 2, wherein each of said first and second zipper strips comprises a closure profile and a flange, said tacked zones on said second elongated continuous structure being respective portions of said flange of said first zipper strip.

4. The method as recited in claim 1, further comprising the step, performed during each dwell time, of inserting a respective article on said second elongated continuous structure, said articles being spaced at regular intervals, one article per unit length, said articles being inserted upstream of where said tacking step is performed.

5. The method as recited in claim 4, wherein said first elongated continuous structure comprises a web of packaging film, said second elongated continuous structure comprises first and second zipper strips that are interlocked with each other, each of said structural features of said first type is a respective pocket formed in said packaging film, each of said articles is a respective slider mounted to said first and second zipper strips, and one unit length equals one package length.

6. The method as recited in claim 1, further comprising the step, performed during each dwell time, of forming a respective structural feature of a second type on said second elongated continuous structure, said structural features of said second type being spaced at regular intervals, one structural feature of said second type per unit length, said structural features of said second type being formed upstream of where said tacking step is performed.

7. The method as recited in claim 6, wherein said first elongated continuous structure comprises a web of packaging film, said second elongated continuous structure comprises first and second zipper strips that are interlocked with each other, each of said structural features of said first type is a respective pocket formed in said packaging film, each of said structural features of said second type is formed by fusing said first and second zipper strips, and

one unit length equals one package length.

8. The method as recited in claim 1, further comprising the steps, performed during each dwell time, of:

tensioning a portion of said second elongated continuous structure disposed upstream of the most recently tacked tack zone; and

inserting a respective article on said tensioned portion of said second elongated continuous structure, said articles being spaced at regular intervals, one article per unit length.

9. The method as recited in claim 1, further comprising the steps, performed during each dwell time, of:

tensioning a portion of said second elongated continuous structure disposed upstream of the most recently tacked tack zone; and

forming a respective structural feature of a second type on said tensioned portion in said second elongated continuous structure, said structural features of said second type being spaced at regular intervals, one structural feature of said second type per unit length.

10. A method of manufacture comprising the following steps:

intermittently advancing a first elongated continuous structure made of flexible material along a process pathway during each work cycle, each advance of said first elongated continuous structure being equal in distance to *N* unit lengths, where *N* is a positive integer greater than unity; said first elongated continuous structure not advancing during a dwell time of each work cycle;

during each dwell time, forming a respective set of *N* structural features of a first type on said first elongated continuous structure, said structural features of said first type of each set being spaced at regular intervals

in a respective section having a length equal to *N* unit lengths, one structural feature of said first type per unit length;

during each dwell time, tacking a respective zone on a second elongated continuous structure made of flexible material to a respective zone on said first elongated continuous structure, said tack zones being spaced at regular intervals along a line that does not intersect said structural features of said first type, one tack zone per *N* unit lengths, and being generally aligned with respective zones separating successive structural features of said first type;

during each dwell time, joining said first and second elongated continuous structures along at least portions of a respective line segment connecting successive tack zones, so that said first and second elongated continuous structures are joined along at least a major portion of each of said line segments connecting successive tack zones,

wherein an untacked and unjoined trailing section of said second elongated continuous structure is pulled forward when said first elongated continuous structure is advanced.

11. The method as recited in claim 10, wherein said first elongated continuous structure comprises a web of packaging film, said second elongated continuous structure comprises first and second zipper strips that are interlocked with each other, each of said structural features of said first type is a respective pocket formed in said packaging film, and one unit length equals one package length.

12. The method as recited in claim 11, wherein each of said first and second zipper strips comprises a closure profile and a flange, said tacked zones on said second elongated continuous structure being respective portions of said flange of said first zipper strip.

13. The method as recited in claim 10, further comprising the step, performed *N* times during each dwell time, of inserting a respective article on said second elongated continuous structure, said articles being spaced at regular intervals, one article per unit length, said articles being inserted upstream of where said tacking step is performed.

14. The method as recited in claim 13, wherein said first elongated continuous structure comprises a web of packaging film, said second elongated continuous structure comprises first and second zipper strips that are interlocked with each other, each of said structural features of said first type is a respective pocket formed in said packaging film, each of said articles is a respective slider mounted to said first and second zipper strips, and one unit length equals one package length.

15. The method as recited in claim 10, further comprising the step, performed *N* times during each dwell time, of forming a respective structural feature of a second type on said second elongated continuous structure, said structural features of said second type being spaced at regular intervals, one structural feature of said second type per unit length, said structural features of said second type being formed upstream of where said tacking step is performed.

16. The method as recited in claim 15, wherein said first elongated continuous structure comprises a web of packaging film, said second elongated continuous structure comprises first and second zipper strips that are interlocked with each other, each of said structural features of said first type is a respective pocket formed in said packaging film, each of said structural features of said second type is formed by fusing said first and second zipper strips, and one unit length equals one package length.

17. A packaging machine comprising:

means for advancing a packaging material in a machine direction;

means for thermoforming a pocket on a packaging material;

means for joining a band-shaped portion of a zipper material to said packaging material; and

means for tacking a spot-shaped portion of said zipper material to said packaging material, said tacking means being upstream of said joining means and downstream of said thermoforming means, and said tacking means and said joining means being generally aligned with each other and laterally offset in a cross direction relative to said thermoforming means.

18. The packaging machine as recited in claim 17, further comprising a controller programmed to activate said advancing means during a first phase and not a second phase of each work cycle, and to activate said thermoforming means, said tacking means and said joining means during said second phase and not said first phase of each work cycle.

19. The packaging machine as recited in claim 18, wherein:

said thermoforming means form one pocket per package-length section of said packaging material;

said tacking means tack a respective zone on said zipper material to a respective zone on said packaging material, said tack zones being spaced at regular intervals along a line that does not intersect said pockets, one tack zone per package-length section of said zipper material, and being generally aligned with respective zones separating said pockets on said packaging material; and

said joining means join said zipper and packaging materials along respective collinear line segments, each line segment connecting successive

tack zones.

20. The packaging machine as recited in claim 17, wherein said tacking means comprise a stationary body and a retractable body that presses said zipper and packaging materials against said stationary body when said retractable body is extended.

21. The packaging machine as recited in claim 20, wherein said retractable body comprises a sealing bar that is heated while in said extended position, said sealing bar applying sufficient heat to meld said zipper and packaging materials together in an area of contact.

22. The packaging machine as recited in claim 20, wherein said retractable body comprises an ultrasonic horn that is energized while in said extended position, said ultrasonic horn applying sufficient energy to meld said zipper and packaging materials together in an area of contact.

23. The apparatus as recited in claim 20, wherein retractable body is disposed underneath said packaging film, while said stationary body is disposed above said zipper material.

24. The packaging machine as recited in claim 17, wherein said joining means comprise a stationary bar and a retractable bar that presses said zipper and packaging materials against said stationary bar when said retractable bar is extended.

25. A packaging machine comprising:

means for advancing a packaging material in a machine direction;

means for concurrently thermoforming *N* pockets on a packaging material, where *N* is a positive integer greater than unity, said pockets being spaced at regular intervals, one pocket per package length;

means for joining a band-shaped portion of a zipper material to said packaging material, said band-shaped zone of joinder having a length equal to almost or about *N* package lengths; and

means for tacking a spot-shaped portion of said zipper material to said packaging material, said tacking means being upstream of said joining means and downstream of said thermoforming means, and said tacking means and said joining means being generally aligned with each other and laterally offset in a cross direction relative to said thermoforming means.

26. The packaging machine as recited in claim 25, further comprising a controller programmed to activate said advancing means during a first phase and not a second phase of each work cycle, and to activate said thermoforming means, said tacking means and said joining means during said second phase and not said first phase of each work cycle.

27. The packaging machine as recited in claim 26, wherein:

said thermoforming means form one set of *N* pockets per section of said packaging material of length equal to *N* package lengths;

said tacking means tack a respective zone on said zipper material to a respective zone on said packaging material, said tack zones being spaced at regular intervals along a line that does not intersect said pockets, one tack zone per section of said zipper material of length equal to *N* package lengths, and being generally aligned with respective zones separating successive pockets on said packaging material; and

said joining means join said zipper and packaging materials along respective collinear line segments, each line segment connecting successive tack zones.

28. The packaging machine as recited in claim 25, wherein said tacking means comprise a stationary body and a retractable body that presses

said zipper and packaging materials against said stationary body when said retractable body is extended.

29. The packaging machine as recited in claim 28, wherein said retractable body comprises a sealing bar that is heated while in said extended position, said sealing bar applying sufficient heat to meld said zipper and packaging materials together in an area of contact.

30. The packaging machine as recited in claim 28, wherein said retractable body comprises an ultrasonic horn that is energized while in said extended position, said ultrasonic horn applying sufficient energy to meld said zipper and packaging materials together in an area of contact.

31. A machine comprising:

N thermoforming die(s) for forming, by application of heat and vacuum, a respective pocket in each of a succession of package-length sections of a web of film, where *N* is a positive integer;

means for intermittently advancing said web by a distance equal to *N* package length(s) per advance;

a tacking station located downstream of said thermoforming die(s), said tacking station comprising a first sealing mechanism for joining, by application of energy, respective portions of a zipper strip to respective portions of said web in a series of spot-shaped tacking zones spaced at regular intervals along the length of said zipper strip, one tacking zone per stroke of said advancing means, said tacked zipper strip being offset from said pockets and not overlapping therewith; and

a sealing station located downstream of said tacking station, said sealing station comprising a second sealing mechanism for joining, by application of energy, respective portions of a zipper strip to respective portions of said web in a series of band-shaped sealing zones connecting said tacking

zones.

32. The machine as recited in claim 31, wherein said first sealing mechanism comprises a retractable heated sealing bar.

33. The machine as recited in claim 31, wherein said first retractable sealing mechanism comprises a retractable ultrasonic horn.

34. The machine as recited in claim 31, wherein said sealing and tacking zones are arranged in alternating sequence along the length of said zipper strip.

35. The machine as recited in claim 34, wherein said zipper strip comprises a closure profile and a flange, said sealing and tacking zones being located on said flange.

36. A system comprising a packaging machine, a zipper processing machine, and a continuous zipper material that follows a process pathway through said zipper processing machine and then through said packaging machine, wherein:

said continuous zipper material comprises a first continuous zipper strip interlocked with a second continuous zipper strip;

said packaging machine comprises a tacking station whereat a respective first portion of said first zipper strip is joined to a respective first portion of a continuous packaging material during a first portion of each work cycle, a sealing station whereat a respective second portion of said first zipper strip is joined to a respective second portion of a continuous packaging material during said first portion of each work cycle, and means for advancing said continuous packaging material during a second portion of each work cycle, said first and second portions being in alternating sequence, each of said second portions of a length in a machine direction substantially greater than a length in said machine direction of each of said first portions; and

said zipper processing machine comprises a slider insertion device and tension control means for maintaining a substantially constant tension of said zipper material in a zone from said slider insertion device to said tacking station during said first portion of each work cycle.

37. The system as recited in claim 36, wherein said tension control means comprise a pair of rollers forming a nip and a torque control device coupled to one of said rollers.

38. The system as recited in claim 36, wherein said packaging machine further comprises one or more thermoforming dies for forming pockets in said packaging film in areas where said zipper material will not be attached.

39. A packaging machine comprising:

means for gripping respective edges of a continuous web of packaging film, said edges being parallel with a machine direction;

a thermoforming die designed to form a pocket in a confronting portion of a gripped web by application of heat and vacuum, said pocket having a pocket length;

a retractable tacking device offset in a cross direction relative to said thermoforming die, said tacking device comprising a contact surface that emits energy when said tacking device is activated, said contact surface of said tacking device having a dimension in the machine direction that is substantially less than said pocket length; and

a retractable sealing device offset in a cross direction relative to said thermoforming die, said sealing device comprising a contact surface that emits energy when said sealing device is activated, said contact surface of said sealing device having a dimension in the machine direction that is greater than said pocket length,

wherein said contact surfaces of said tacking and sealing devices lie along a line that is parallel with said machine direction and are separated by a space when said tacking and sealing devices are extended, said contact surface of said sealing device being located downstream relative to said contact surface of said tacking device, and said line being offset in a cross direction and located downstream in a machine direction relative to said thermoforming die.